Coastal Change Management Areas Methodology Background Paper

Pembrokeshire Coast National Park

Replacement Local Development Plan

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Pembrokeshire Coast National Park Authority

Contents

Introduction

1.1 This document sets out the methodology used to define the Coastal Risk Management Areas for the Proposals Map in the Replacement Local Development Plan. The areas are intended to identify where the land is at risk from inundation from the sea from the present time and in the longer term. Within these areas new development may be restricted.

1.2 The methodology is prepared to reflect national planning legislation and guidance and to minimise the risk to life and property from flooding and storm-damage. The identification of these areas is also intended to help coastal communities to adapt to coastal change.

National Planning Policy

2.1 Planning Policy Wales Edition 9 (November 2016) sets out the National Planning Policy framework which is strongly focussed on sustainable development. The Welsh Government's approach shares the UK principles of:

- Living within environmental limits (using only our fair share of the earth's resources)
- Ensuring a strong, healthy and just society (improving the quality of life and well-being of the people of Wales)
- Achieve a sustainable economy (transforming to a low carbon, low waste economy)
- Promoting good governance (confirming and embracing sustainable development)
- Using sound science responsibly (using sustainable development principles as part of an evidence-based approach to policy-making).

2.2 Planning Policy Wales lists sustainable development principles which are to be adhered to by all those involved in the planning system and include:

- Taking a long-term perspective to safeguard the interests of future generations, whilst at the same time meeting needs of people today;
- Applying the precautionary principle. Cost-effective measures to prevent possibly serious environmental damage should not be postponed just because of scientific uncertainty about how serious the risk is;
- Using scientific knowledge to aid decision-making;

- Taking account of the full range of costs and benefits over the lifetime of a development, including those which cannot be easily valued in money terms when making plans and decisions and taking account of timing, risks and uncertainties. This also includes recognition of the climate a development is likely to experience over its intended lifetime.

2.3 Among other things the sustainability objectives need to promote resource-efficient and climate-change resilient settlement patterns and minimise the risk posed by, or to development on or adjacent to unstable land or land liable to flooding.

2.4 It is known that climate change will impact on weather and the physical environment and the coastal areas are likely to be some of the most affected areas. Wales can expect increased rainfall and increased frequency of intense rainfall, rising sea levels and more extreme weather events, such as severe storms.

2.5 Local planning authorities are required to establish what the coast means for them and to develop or apply specific policies, acknowledging inter-relationships between physical, biological and land use characteristics of coastal areas and the impacts of climate change. This will allow planning authorities to identify areas suitable for development and those subject to constraints, including those posed by flood risk or land instability.

2.6 Local Development Plans are required to have regard to Shoreline Management Plans which establish long-term policy frameworks for the management of coastal risk.

2.7 Flood risk is a material planning consideration in land use planning. Flooding as a hazard involves the consideration of the potential consequences of flooding, as well as the likelihood of an event occurring. Risks to human life and damage to property must be fully recognised, even where mitigation measures are proposed.

2.8 The Welsh Government's objectives for sustainable development requires action through the planning system to move away from flood defence and the mitigation of consequences to a more positive avoidance of development in areas defined as being of flood hazard. Planning authorities should adopt a precautionary principle when formulating development plan policies on development and flood risk and when considering planning applications. In this context, the principle should be applied on the basis that climate change is likely to increase the risk of coastal and river flooding as a result of sea-level rise and more intense rainfall and reduce service levels provided by surface water drainage infrastructure.

2.9 Development proposals should seek to reduce, and certainly not increase, flood risk arising from river and/or coastal flooding. A sustainable approach to flooding will therefore involve the avoidance of development in flood hazard areas and, where possible or practical, the encouragement of managed retreat the creation of wash-lands and flood plain restoration.

Wales National Marine Plan

2.10 In December 2017, Welsh Government published a consultation draft Wales National Marine Plan, which will guide decisions on the sustainable use of Welsh seas. Specifically, the Plan is intended to: integrate policy with the rest of the UK, guided by the UK Marine Policy Statement; support the vision for clean, healthy, safe and biologically diverse seas; guide future sustainable development; support "blue growth" by directing key decisions taken on the future use of marine space and natural resources.

Technical Advice Note 15: Development and Flood Risk (2004)

2.11 The aim of this document is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions.

2.12 The TAN relates to Development Advice Maps – now provided and regularly updated by Natural Resources Wales with flood risk defined in zones:

- Zone A – considered to be at little or no risk of flooding;
- Zone B – Areas known to have been flooded in the past by evidence of sedimentary deposits;
- Zone C – based on Natural Resources Wales extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal);
- Zone C1 – Areas of floodplain which are developed and served by significant infrastructure, including flood defences; and
- Zone C2 – Areas of the floodplain without significant flood defence infrastructure.

2.13 Guidance is provided as to the precautionary approach needed to be taken in each of the zones. Within Zone C flooding issues should be an integral part of planning decisions with justification required to develop within C1 Zones. Only less vulnerable development should be considered (and only with justification) within C2 Zones.

2.14 The TAN was published in 2004 and prior to its updated publication scheduled for 2018, several policy clarification letters issued by the Welsh Government have provided up-to-date advice, some of which has resulted from the consequences of recent flood and storm events. They include the following:

- January 2014 – advising on insurance for existing properties in high risk flood areas (Flood Re), which is only available to properties built prior to 2009. Properties built after this date are subject to uncapped risk reflective premiums and in order to minimise the impact, new developments should only be permitted in flood risk areas where it can be made safe, resistant and resilient to flooding. It advises that Natural Resources Wales assumes a lifetime of 100 years for residential developments and 75 years for non-residential development. Climate change needs to be part of the consideration over the lifetime of development.
- January 2015 – advised of updated Development Advice Maps and the availability of second generation Shoreline Management Plans representing the preferred approach to managing coastal risk agreed by local authorities and Natural Resources Wales. Local Development Plans are required to have regard to the Shoreline Management Plans to align long-term policies and help avoid inappropriate development.
- August 2016 – provides guidance on how projected increases to peak river flows and sea levels, resulting from climate change, should be incorporated into flood consequence assessments. Sea level rise is shown over the period 2009 to 2116, divided into epochs and with a cumulative rise of 1094mm. Developments with a 75-year lifespan would need to be resilient to a sea level rise of 731.5mm and 1094mm for residential developments. The letter also advises on the need to consider increased frequency, duration and severity of storms and impacts of extreme wave action.

Shoreline Management Plans

3.1 There are two Shoreline Management Plans (SMPs) covering the Pembrokeshire Coastline. The South Wales SMP[1] (Lvernock Point to St Ann's Head) covers the area from Amroth to St Anne's Head; the West of Wales SMP[2] covers from St Anne's Head to Poppit.

3.2 Shoreline Management Plans provide large-scale assessment of the risks associated with coastal erosion and flooding at the coast. They present policies to help manage these risks to people and to the developed, historic and natural environment in a sustainable manner. SMPs form an important part of the Welsh Government's strategy for managing risks due to flooding and coastal erosion.

3.3 The areas within the National Park identified in the SMP2s as having immediate or longer term flood or erosion risk from the sea are:

[1] http://www.southwalescoast.org/
[2] http://www.westofwalessmp.org/content.asp?nav=23&parent_directory_id=10

South Wales SMP2

a. Amroth (Increasing risk of flooding from present day. Eventual failure of defences in medium/long term) (Policy unit 16.2)

b. Wiseman's Bridge (Need to develop an exit strategy which may involve relocation of assets in medium-term. Long-term public funding of defences is not viable). (Policy unit 16.4)

c. Saundersfoot (Adaptation measures required from the short-term. Likelihood of increased frequency of flooding leading to managed realigned in the long-term.) (Policy unit 16.7)

d. South Beach, Tenby (roll-back of the dunes will affect some assets in the medium to long-term) (Policy unit 16.12)

e. Lydstep Haven (Existing defences have limited lifespan and the holiday park may require adaptation/relocation in the medium term.) (Policy unit 17.2)

f. Freshwater East (roll-back of the dunes may affect some assets in the medium to long-term) (Policy unit 17.4)

g. Angle (Evolution and retreat of the coast will lead to increased flooding for some properties and assets. Adaptation of properties required. Private funding will be required to maintain/realign the road to Angle Point.) (Policy unit 19.2)

h. The Gann (Natural evolution of the coast through managed realignment whilst managing the risk of coastal erosion or flooding to the B4327 which provides the only access to Dale). (Policy unit 21.2)

i. Dale (Hold the line for as long as possible by maintaining existing defences, but managed realignment necessary in the long-term.) (Policy unit 21.3)

West of Wales SMP2

j. St Brides (Increased risk to properties in the long-term.)

k. St Brides to Little Haven road (may require realignment in the long-term.) (Policy unit 2.1)

l. Settlands road (potential loss of road in the long-term) (Policy unit 2.3)

m. Little Haven (Hold the line in the short-term with managed realignment necessary thereafter which is likely to result in loss of the existing road and some properties along the frontage.) (Policy unit 2.2)

n. Broad Haven (Increased pressure on existing defences will lead to increased frequency of flooding. Some managed retreat will be necessary

along some of the frontage and potential loss of road to the north.) (Policy units 2.4 and 2.5)

o. Nolton Haven (Natural evolution of the bay will protect the road, with no extension of defences along the earth bank section.) (Policy unit 2.8)

p. Newgale (loss of road, car park and properties as shingle bank rolls back from current time). (Policy units 2.10, 2.11 and 2.12)

q. Solva (Hold the line in the short-term but managed realignment will be necessary in the future with the need to remove some properties from the flood plain.) (Policy unit 3.2)

r. Whitesands (long-term realignment will result in loss of the car park). (Policy unit 3.8)

s. Abereiddi (managed realigned has commenced. Replacement car park facilities are being considered.) (Policy unit 3.9)

t. Newport Parrog (Managed realignment is necessary as existing defences are unlikely to be effective even in the short-term and no public funding available. A policy of no active intervention in the longer-term would restore a natural beach frontage. Pembrokeshire County Council is currently submitting a bid for grant funding from the Welsh Government to raise the existing defences and install flood gates. The outcome of the bid is currently uncertain.) (Policy unit 4.15)

u. Nyfer Estuary (allow natural development of the estuary that would not preclude local private defences, if appropriate). (Policy unit 4.16)

v. Newport Sands (managed realignment of the defences with stepped retreat reverting to no active intervention in the long-term. This would impact the car park and access road.) (Policy unit 4.18)

Coastal Risk Areas

4.1 The Shoreline Management Plans identify many areas within the National Park which are at risk now and in the longer-term of coastal inundation through sea-level rise, coastal erosion and loss of defences. It is important to identify areas likely to be affected by such events, start planning for the consequences and enabling communities to adapt.

4.2 In order to comply with the sustainable development approach advocated by Welsh Government of positive avoidance of development in areas defined as being of flood hazard and taking a long-term view it is necessary to identify

areas on the Proposals Map within which new development will be restricted, in line with national planning policy and guidance.

Coastal Risk Area Identification Methodology

5.1 The Shoreline Management Plans were used to identify the locations around the coast where flood or erosion risk was identified within the three Shoreline Management Plan epochs (years 1 to 20; 20 to 50 and 50 to 100). These locations and the risk identified were published in the Climate Change Background Paper published alongside the Review Report in June 2016 and the Draft Preferred Strategy of the Local Development Plan in 2017.

5.2 A LiDAR[3] composite dataset Digital Terrain Model data for the identified locations was downloaded from the Welsh Government's Lle data portal at the finest available resolution. For each area the required files were referenced into a virtual raster table (VRT) using QGIS (geographic mapping system).

5.3 For each location and for each of the 3 Shoreline Management Plan epochs (base date 2005) the data was calculated to show maximum tide heights. The resulting datasets were then converted to mapping polygons.

5.4 Table 1, below shows the maximum high tides for each of the identified locations for each of the 3 epochs.

Table 1: Maximum tide heights for identified coastal risk locations up to 2115[4]

Places	t1	t100	Up to 2026	Up to 2080	Up to 2115*
Sea Level Rise Allowance (m)			0.067	0.605	1.126
Amroth	4.82	5.33	5.40	5.94	6.46
Wisemans Bridge	4.79	5.31	5.38	5.92	6.44
Saundersfoot	4.79	5.31	5.38	5.92	6.44

[3] LIDAR, which stands for *Light Detection and Ranging,* is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. These light pulses—combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics.

[4] Adapted from Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk management Authorities in Wales

Places	t1	t100	Up to 2026	Up to 2080	Up to 2115*
South Beach	4.67	5.19	5.26	5.80	6.32
Lydstep	4.59	5.11	5.18	5.72	6.24
Freshwater East	4.46	4.97	5.04	5.58	6.10
Angle	4.14	4.67	4.74	5.28	5.80
Dale	4.14	4.67	4.74	5.28	5.80
St Brides	3.63	4.10	4.17	4.71	5.23
Little Haven	3.59	4.06	4.13	4.67	5.19
Broad Haven	3.59	4.06	4.13	4.67	5.19
Nolton Haven	3.55	4.02	4.09	4.63	5.15
Newgale	3.53	4.00	4.07	4.61	5.13
Solva	3.49	3.95	4.02	4.56	5.08
Whitesands	3.18	3.62	3.69	4.23	4.75
Abereiddy	3.04	3.46	3.53	4.07	4.59
Newport Parrog	3.09	3.52	3.59	4.13	4.65
Nyfer	3.09	3.52	3.59	3.13	4.65
Newport Sands	3.09	3.52	3.59	3.13	4.65

*Projections beyond 2115 should be derived by extrapolating beyond 2115.

5.5 The data provided by the mapping was further considered alongside the preferred policy for each location identified in the Shoreline Management Plans. The Shoreline Management Plan policies also indicate where frontages, properties, roads or other assets are likely to be lost through failure of existing coastal defences or where it will not be sustainable or viable to continue to maintain defences as sea level rises. They also take into account stormy conditions which will have physical impacts on the coastal risk areas.

5.6 The following table shows the decisions made to amend the initial mapping when considering each of the areas.

Table 2:

Location	**Amendments made to the basic mapping of maximum high tide areas as a result of Shoreline Management Plan preferred policies**
Amroth	Properties along the frontage included to reflect long-term SMP policy that existing defences will reach end of their life. It will not be technically or socio-economical viable to continue maintenance and policy to change to no active intervention to allow the shoreline to naturally evolve and retreat.
Wiseman's Bridge	Area extended to include road along head of beach. Long-term policy as Amroth.
Saundersfoot	Extend the area to include The Strand. Medium to long-

Location	Amendments made to the basic mapping of maximum high tide areas as a result of Shoreline Management Plan preferred policies
	term policy of managing increasing risk of inundation and managed realignment, particularly along The Strand.
North Beach, Tenby	Developed area as shown on maximum tide map. No additional areas included.
South Beach, Tenby	South Beach Car Park, and Water's Edge included. These assets would be affected by wave topping and storminess.
Lydstep Haven	No risk area shown as the extent of likely erosion is unknown, although it is likely that the relocation of some of the holiday accommodation will necessary.
Freshwater East	No risk area shown as the extent of likely erosion is unknown. Managed realignment of the dune system is proposed but does not preclude maintenance of existing private defences, although public funding would not be available.
Angle	Developed area as shown on maximum tide map. No additional areas included.
Dale	Developed area as shown on maximum tide map. No additional areas included.
Gann	This additional area is included as existing properties are affected by sea-level rise.
St Brides	No risk area shown. Maximum tide levels not impacting on properties in this location.
Little Haven	Additional properties along St Brides Road included to reflect low-lying ground.
Broad Haven	Properties along the beach frontage, and inland at the south end of Broad Haven included to reflect medium to long-term SMP policy which acknowledges that protecting the whole frontage is not expected to be justified with the risk of flooding over time and the need for retreat within this area.
Nolton Haven	No risk area shown as maximum high tide levels are not shown to impact on properties.
Newgale	The risk area included is reduced to reflect only the developed area close to the coast.
Solva	Developed area as shown on maximum tide map. No additional areas included.
Whitesands	No risk area shown. Maximum tide levels not impacting on properties in this location.
Abereiddy	No risk area shown. Maximum tide levels not impacting on properties in this location.
Newport	Developed area as shown on maximum tide map. No additional areas included.

5.7 The resulting areas will be shown on the Proposals Map in the Deposit Replacement Local Development Plan. The mapped areas will be used in conjunction with Policies 36 (Development in the Coastal change Management Area); 37 (Relocation of Existing Permanent Dwellings affected by Coastal Change); and 38 (Relocation and replacement of development (other than residential) affected by coastal change).

References

Planning Policy Wales (Edition 9, November 2016)

http://gov.wales/docs/desh/publications/161117planning-policy-wales-edition-9-en.pdf

Technical Advice Note 15: Development and Flood Risk

http://gov.wales/topics/planning/policy/tans/tan15/?lang=en

Policy Clarification Letter (January 2014): Planning Policy on Flood Risk and Insurance Industry Changes

http://gov.wales/topics/planning/policy/dear-cpo-letters/flood-risk-and-insurance-changes/?lang=en

Policy Clarification Letter (January 2015): Update of TAN15 Development Advice Maps and approval of Shoreline Management Plans

http://gov.wales/topics/planning/policy/dear-cpo-letters/update-of-development-advice-maps/?lang=en

Policy Clarification Letter (August 2016): Guidance on Climate Change Allowances for Planning Purposes

http://gov.wales/topics/planning/policy/policyclarificationletters/2016/cl-03-16-climate-change-allowances-for-planning-purposes/?lang=en

West of Wales Shoreline Management Plan 2

http://www.westofwalessmp.org/content.asp?nav=23&parent_directory_id=10

South Wales Shoreline Management Plan 2

http://www.southwalescoast.org/

Adapting to Climate Change: Guidance for Flood and Coastal Risk Management Authorities in Wales (December 2017): Welsh Government

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